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was like a May day. The leaves were fast coming out on the shrubbery. Red Maples were in full blossom. Frogs and Toads were singing. Violets were blooming everywhere in the woods and in all the gardens Narcissus and Daffodils, May haw and Dogwood trees were white with flowers, and many other shrubs that were entirely new to me. Birds were singing everywhere—Mockingbirds, Brown Thrashers, Cardinals, Tufted Tits and Carolina Wrens. And the bright varnished leaves of the big Magnolia trees and the grey-green of the Live Oaks, and everywhere the grey moss hanging. Peach and Pear trees were in full bloom and the mosquitoes were also there by the hundreds and only too anxious to annoy one. I should have liked to have spent a few days more at Mandeville, but I received word that I must be back in Chicago by February 27th, and it was not without a feeling of regret that I left the sunlit southern woods and turned my face northward, but still the thought cheered me that I would reach Chicago ahead of the birds and would have the novelty of watching the spring arrive twice this year.

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#### A VULTURE CENSUS AND SOME NOTES.

BY JOHN WILLIAMS, ST. MARKS, FLA.

"One might almost be willing to be a Buzzard to fly like that!" \*

Familiarity may breed contempt in some instances, but I have ever found that an intimate acquaintance with Nature in any aspect, at any season, in any clime, invariably leads to fresh wonderment and renewed kinship and esteem. Vultures are not commonly objects for adoration, I verily believe, and yet they have many attributes to be admired.

Majestic Ease would seem to be an appropriate expression for the wide-encircling, smooth and graceful evolutions of *Cathartes aura septentrionalis* as he serenely defies the tempo on unbending wings, calmly floating far on high or again

\* Bradford Torrey, in "A Florida Sketch Book."

descending in more or less rapid turns towards the earth. Tireless he seems, and unless it be for a more speedy ascent it is seldom that the beat of his wings is to be observed. There is much to admire in this master of aviation from whom we may learn the conquest of the air. Every curve and bend of sail so adjusted to gain the vantage of the lightest breeze or float on calmest air; an engine powerful to conquer the hurricane, balanced to finest poise and rudder of perfect control.

Not so much can be said for the grace of the other member of this family found in our southern states. While even more robust in appearance, *Catharista urubu* fails in engine power or cut of sail and is forced to greater effort in many evolutions. At times they may be seen high in air sailing on even keel with never a wing beat, but with stiffening breeze, in circling flight the balance wheel seems out of true and a few quick strokes are needed to make the turn and a similar effort, alternating with a glide, is their mode in straight away flight.

In contour, while flying, the two species present marked contrast. The Turkey Vulture is the larger appearing bird with wings and tail longer. In this species the forward contour of the wings presents a recurved aspect under usual conditions of flight, tending backward towards the tip where the longer primaries are usually widespread like open fingers. The other species has wings of wider tapering form from body to tip, which is gracefully and abruptly slender; the whole wing with a slightly forward curve under usual conditions. The head and tail show from below at a distance in about equal prominence. The Black Vulture carries a prominent grayish or light-colored area at the extremity of the wings, showing plainly from above or below when the bird is in flight. With the Turkey Vulture a similar effect is shown along the outer, under border of the secondaries when the bird is flying.

Turkey Vultures in general are more solitary in their hunting expeditions, although they may congregate in large num-

bers when food is abundant, but with the other species it is the rule that several are to be seen in company as they patrol the air; my observations indicate that the two species fraternize but slightly at a repast. One will predominate while the other may be in evidence, but frequently only seen awaiting an opportunity to participate later.

In coming down to alight, the Black Vulture usually circles but little; he may come on half-closed wings with mighty rush or drop gently down, down, down in an almost vertical line, with wings well open or in graceful spirals, approach the meal, but however it may be the legs will usually be seen to drop some time before the bird alights; on the other hand the Turkey Vulture seems more determined on investigation or may be more alert to danger and rarely drops direct to perch or food but circles and quarters before coming to rest and no sight of dropping feet or legs until the final stop. Again a difference may be seen in times of heavy winds; the larger bird being able to adjust itself to gusts and squalls by dip of planes, while the shorter, broader wings of the Black Vulture demand the wing beats at such times.

These birds fill an important position in our southern land, particularly where we have the open range. They are in no degree harmful, and yet it is not unusual for some wise-headed legislator to conceive the idea of their spreading disease—Hog Cholera, Glanders, Anthrax, etc., and will too often succeed in making some unfortunate statute removing protection from these valuable birds.

#### COURTSHIP AND NESTING.

BLACK VULTURE—I have several times noticed what I took to be a love flight or courtship in which two birds make rapid, prolonged flight in wide-spread circles, lasting eight or ten minutes, at times shorter and again repeated soon. On February 10-21-24 and March 10 of different years I have recorded such occurrences and never have seen it with Turkey Vultures.

March 24 two eggs were seen on the ground in the hollow

burnt-out base of a large, standing living pine. These eggs were removed and on April 20 two eggs were found in a similar site about two hundred yards from the former location.

TURKEY VULTURE—On April 17 a single young bird was seen, about two weeks old.

April 29 of another year two eggs were found; incubation almost completed.

Coming now to the actual enumeration: I have for the past three years, each day recorded the greatest number of each species of these Vultures, seen at one time. I cannot claim any exact result for such uncertain work. It was done as occasion presented while about my usual duties or when opportunity offered. It perhaps gives a fair idea of the comparative abundance of the two species and *possibly* some notion of their numbers here. Following the tables will be noted some causes for certain divergences in corresponding months of the period:

October and November are months when we usually have fish in greatest abundance and many are salted, while the offal attracts the Vultures. February and March and sometimes April are months when, following a severe winter, the mortality of stock on the open range is considerably increased and Vultures are more in evidence.

During 1916 this stock loss was greatest in February, while in 1917 and 1918 such loss was about a month later, as shown by the increased numbers of Black Vultures recorded. The Turkey Vultures do not seem to congregate in the spring to the degree they do in the fall. Excess in numbers of Black Vultures in August, 1917, was due to several bountiful feasts of alligators, goats and hogs. The greatest number recorded for a single month was in November, 1915, when 771 Black Vultures and 766 Turkey Vultures were noted.

The largest number seen during one day was on November 7, 1915; 142 Black Vultures and 163 Turkey Vultures were then counted.

During the three years there were 75 days when no Black

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BLACK VULTURE												TURKEY VULTURE																			
	Totals			Daily Average			Daily Max.			Daily Min.			Totals			Daily Average			Daily Max.			Daily Min.									
	* 1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3							
August .....	57	61	255	1.84	1.97	8.23	13	10	31	0	0	0	0	0	0	103	62	73	3.31	2.00	2.35	9	5	7	3	1	0	0	0	0	
September.....	202	156	136	6.73	5.20	4.55	25	59	15	0	1	0	0	1	0	199	108	45	6.30	3.60	1.50	14	10	2	1	1	0	1	0	0	
October.....	378	128	325	12.20	3.97	10.50	44	17	49	0	1	1	1	0	1	427	110	101	13.80	3.55	3.27	94	14	13	2	1	0	2	6	0	
November.....	771	530	259	25.70	17.66	8.24	142	63	52	2	1	1	1	1	1	766	497	206	25.53	16.56	6.87	163	116	27	7	1	1	1	3	0	
December.....	132	132	165	4.26	4.26	5.32	20	22	16	0	0	0	0	0	0	157	119	95	5.07	3.84	3.06	28	9	10	0	0	1	1	2	5	
January.....	228	215	156	7.29	7.17	5.03	37	53	15	0	0	0	0	0	0	86	158	100	2.77	5.27	3.09	6	47	8	3	9	6	1	6	0	
February.....	273	214	104	9.41	7.64	3.71	61	39	16	0	1	0	0	0	0	86	66	66	2.96	2.86	2.36	7	5	6	4	6	1	1	1	0	
March.....	176	375	408	5.68	12.10	13.15	16	31	54	1	1	0	0	0	0	104	86	115	3.55	2.77	3.71	12	6	12	2	5	6	2	5	0	
April.....	304	181	316	10.13	6.03	10.53	26	44	43	1	1	1	1	0	0	73	77	84	2.43	2.57	2.80	4	6	12	5	8	6	1	1	1	0
May.....	260	103	203	8.39	3.32	6.55	35	15	31	1	1	1	1	1	1	77	66	71	2.48	2.13	2.29	6	5	6	1	1	1	1	1	1	0
June.....	215	249	114	7.17	8.30	3.80	26	67	11	0	0	0	0	0	0	63	55	60	2.10	1.83	2.00	5	5	6	0	0	0	0	0	0	0
July.....	162	122	189	5.23	3.94	6.10	20	12	22	0	0	0	0	0	0	60	71	62	1.93	2.29	2.00	7	8	4	1	0	1	2	13	2	13
Total.....	3156	2451	2630							41	9	25	0	0	0	2191	1475	1078													
Averages .....	263	205	219	8.67	6.80	7.14										182.7	122.9	89.8	6.02	4.08	2.94										

\*1 indicates year 1915-16  
 2 indicates year 1916-17  
 3 indicates year 1917-18  
 o The upper figure (italic) under "Daily Minimum" shows the total days in that month when the recorded number were observed;  
 i. e.: in August, 1915, no Black Vultures were seen for 16 days.

Vultures were seen, and for same period but 21 blank days for the Turkey Vultures, while the daily maximum number of each month was 20 or more for 25 months of the 36 months under consideration for the Black Vultures, and only six months for the Turkey Vultures, thus indicating, as the daily records show, a much greater variability in the occurrence of *C. urubu*.

It is to be noted that while the yearly totals of Turkey Vultures are considerably below those of the Black Vultures the greatest number seen for any single day, covered by the whole record, was the 163 Turkey Vultures on November 7, 1915. This fact taken alone might lead to the conclusion that this species must be more numerous in our vicinity than is the Black Vulture, but as the daily records show a great excess of both species from October 14 to November 21, 1915, due to an unusual amount of available food, it seems reasonable to believe that birds of both kinds were attracted from afar.

The following table indicates the aggregate of daily minimums—0, 1, 2—for the three years, August, 1915, to July, 1918, inclusive. In no month for the entire period did the daily minimum exceed 2:

	Black Vulture			Turkey Vulture		
	0	1	2	0	1	2
August . . . . .	19	0	0	5	0	0
September . . . . .	6	11	0	1	13	0
October . . . . .	1	12	0	0	12	2
November . . . . .	3	1	1	1	4	0
December . . . . .	10	0	0	3	5	0
January . . . . .	10	9	0	3	15	0
February . . . . .	9	6	0	0	17	4
March . . . . .	4	7	0	0	13	0
April . . . . .	0	14	0	0	19	0
May . . . . .	0	18	0	0	24	0
June . . . . .	8	0	0	6	0	0
July . . . . .	5	2	0	2	26	0
Totals . . . . .	75	80	1	21	148	6

These totals indicating that in the case of the Black Vulture on 75 days of the three years none was seen; on 80 days but one was seen daily, and on one day but two were noted,

while in the case of the Turkey Vulture there were but 21 blank days; one only on 148 days, and on six days but two were seen daily.

Table indicating the total of monthly enumerations for the three years arranged in numerical sequence:

Black Vulture			Turkey Vulture		
57	162	255	45	73	104
61	165	259	55	73	108
103	176	260	60	77	110
104	187	273	60	77	115
114	189	304	62	84	119
122	202	316	62	86	151
123	203	325	63	86	158
132	214	375	66	86	189
132	215	378	66	95	206
136	215	408	66	100	427
156	226	530	71	101	497
156	249	771	71	103	766

Which gives the following summary:

	Black Vulture	Turkey Vulture
Under 100 birds seen during.....	2 months	21 months
100 to 199.....	15 months	11 months
200 to 299.....	11 months	1 month
300 to 399.....	5 months	0 months
400 to 499.....	1 month	2 months
500 to 699.....	1 month	0 months
700 to 799.....	1 month	1 month

So that we find 61 per cent of the months show less than 100 Turkey Vultures seen monthly, and only  $5\frac{1}{2}$  per cent of the months show 100 Black Vultures seen monthly.

During the period of three years there are but eight days when no Vultures were seen, and as with but one exception such occurrences were on extremely hot or very stormy weather it may have been due to lack of observation rather than absence of the birds.

From September 23, 1917, to October 5, 1917,\* inclusive, was spent at our lighthouse, eight miles down the river and located on a barren spit of the mainland.

During that time the total of Turkey Vultures seen was

\* In the table of general enumeration, in order that each month should show complete, an average for the days of actual count at St. Marks during September and October, 1917, was made and added for the days during my absence at the lighthouse.



34; daily average, 2.62; daily maximum, 6.; daily minimum (2 da.), 0.

While not a single Black Vulture was seen during the period and during these thirteen days most of my time was spent out of doors with more than the usual opportunity for observation, hence the supposition seems fair that the Black Vulture shuns immediate proximity to our gulf waters. In further corroboration I find that my records for nine excursions to the lighthouse and to other points along shore show but one instance when the Black Vultures were observed, while Turkey Vultures were noted on six of these trips. I am aware that this does not agree with the experience of others and there may be some local cause.

The accompanying records show the daily occurrences for various months illustrative of

- (a) Greatest numbers seen;
- (b) Greatest variance of the two species;
- (c) Fewest numbers seen; which was also the month showing the least variance of the two species:

Day of Mo.	Nov. 1915		June, 1917		Aug. 1916	
	Bk. V.	Tky. V.	Bk. V.	Tky. V.	Bk. V.	Tky. V.
1	68	53	6	2	1	1
2	20	8	13	2	10	5
3	28	12	6	2	0	2
4	45	30	1	0	1	1
5	20	28	1	2	0	2
6	30	25	2	1	4	2
7	142	163	1	5	6	2
8	30	20	14	1	2	1
9	20	15	2	1	3	3
10	20	19	1	1	6	3
11	12	10	1	4	6	3
12	12	20	2	2	0	2
13	10	20	0	3	0	1
14	10	20	1	1	1	5
15	60	50	2	1	5	2
16	40	50	7	3	0	0
17	30	40	31	3	0	2
18	15	25	67	3	8	2
19	40	70	42	0	3	2
20	15	30	27	3	0	1
21	40	20	3	3	0	1
22	6	4	1	1	0	3
23	3	5	0	1	0	2

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24	3	3	8	1	0	4
25	2	0	5	4	0	3
26	22	7	1	1	0	1
27	3	2	2	1	0	1
28	3	2	0	1	0	2
29	12	11	1	0	4	1
30	10	4	1	2	1	1
31					0	1
Totals	<u>771</u>	<u>766</u>	<u>249</u>	<u>55</u>	<u>61</u>	<u>62</u>

From the foregoing notes the following conclusions are suggested relative to the two species of Vulture in this vicinity.

*Catharista urubu* occurs in greater numbers.

It is found more frequently associated and is more variable in occurrence.

It flies more direct to a feeding place and usually drops the feet and legs sometime before alighting.

It is the less numerous species close to the gulf shore.

*Cathartes aura septentrionalis* not as numerous in the springtime as in the fall and winter.

The two species do not usually associate intimately while feeding.

Both species may be attracted from long distances when food continues to be abundant; 142 Black Vultures and 163 Turkey Vultures were counted on one and the same day.

During a term of three years there were 75 days when no Black Vultures were seen and but 21 days when no Turkey Vultures were observed, and for the same period during 25 months the daily maximum reached or exceeded twenty in the case of *C. urubu*, and for but six months with *C. a. septentrionalis*.

Extremes of variation in the enumeration show 375 Black Vultures and 86 Turkey Vultures counted during March, 1917, and in August, 1916, the numbers were 61 Black Vultures and 62 Turkey Vultures.